



# Artificial Gravity Research Project Overview

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International Countermeasures Research Working Group Meeting  
Prague – June 30<sup>th</sup>, 2015

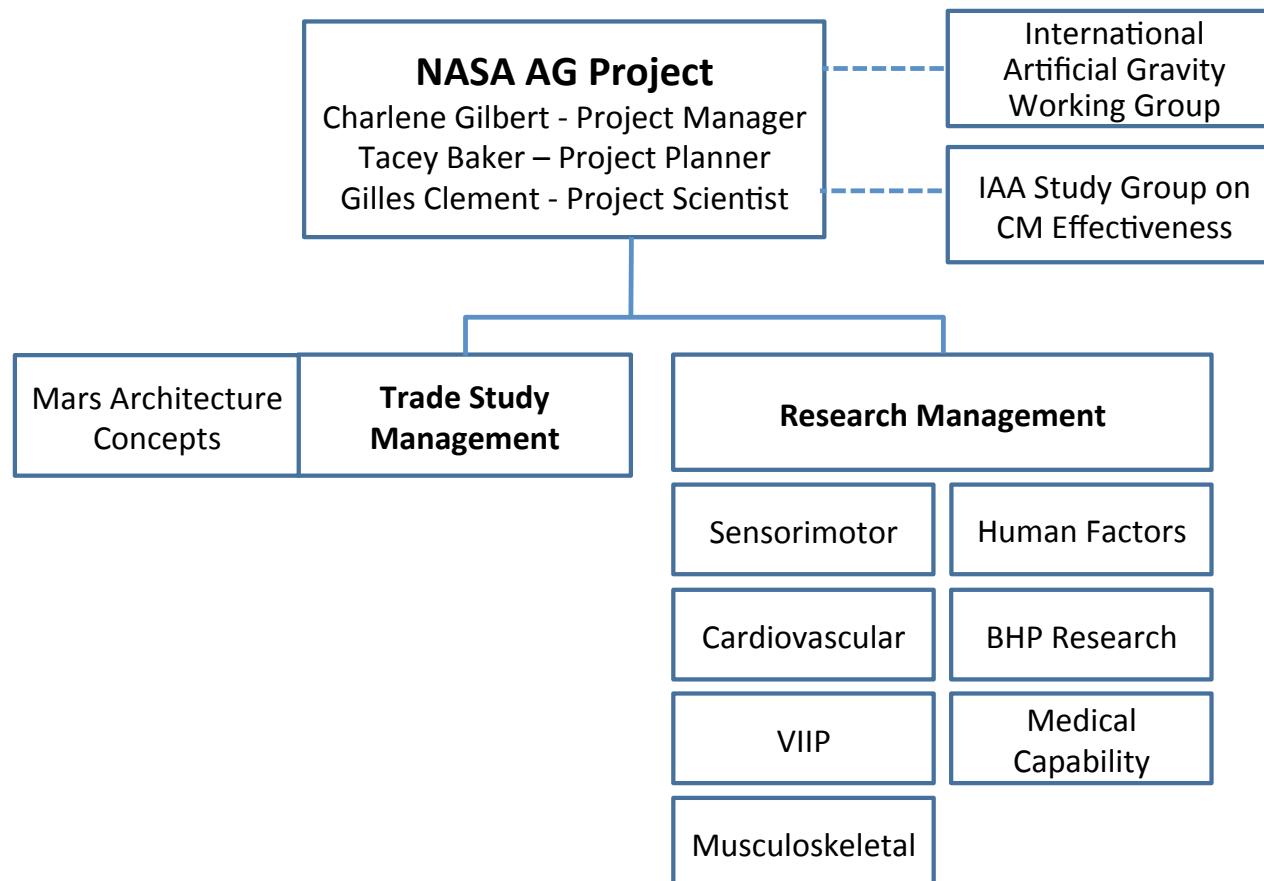
Gilles Clement, Tacey Baker, & Charlene Gilbert

Wyle Science, Technology & Engineering Group  
and NASA Johnson Space Center, Houston TX

# NASA AG Project

- **Goal**
  - Determine the design trade space associated with AG for Mars DRM vehicles and habitats.
- **Objectives**
  - Implement an evidence-based, peer-reviewed, coordinated R&D project to investigate AG.
  - Determine the optimal design characteristics for a AG countermeasure.
- **Milestone**
  - Decision criteria whether AG can protect crew health and performance during human deep space missions expected NET 2022.

# AG Project Structure



## AG Project Status

- **March 2014** – HRP approval to initiate the Artificial Gravity project to develop evidence-based recommendations for or against the use of AG in deep space transit vehicles by 2022.
- **September 2014** – Creation of Intern'l AG Working Group as a sub-group of the International Countermeasure Group.
- **December 2014** – External AG Advisory Panel.
- **March 2015** – Evidence Report on Artificial Gravity.  
Available at: <http://www.xxx.xxx>
- **May 2015** – Research Plan, in progress.
- **June 2015** – Project Management Plan, in review.
- **July 2015** – Research solicitation.

# AG Research Plan

## 1. AG Level

- G dose-physiological response relationship
- Humans, rodents, cells
- Parabolic flight, unloading, centrifugation, bioreactor, random positioning machine, computational models

## 2. AG Duration and Frequency

- Continuous rotation
- Intermittent rotation

## 3. Health Consequences of AG

- Cross-coupled and Coriolis accelerations
- Gravity gradient
- Intracranial pressure

## 4. Validation of AG Prescription

- Comparison between animal centrifugation on the ground and in space
- Tests of a human centrifuge in space

# Research Plan Summary